

AMENDMENTS TO THE CLAIMS

Claim 1 (Original) An integrated circuit, comprising:

a switch;

a capacitor; and

a nonconductive oxygen barrier located between said switch and said capacitor.

Claim 2 (Original) An integrated circuit as in claim 1 wherein said oxygen barrier comprises strontium tantalate.

Claim 3 (Original) An integrated circuit as in claim 2 wherein said oxygen barrier further comprises silicon nitride.

Claim 4 (Original) An integrated circuit as in claim 1 wherein said capacitor comprises a bottom electrode having a bottom-electrode side edge, and at least a portion of said oxygen barrier is located on said bottom-electrode side edge.

Claim 5 (Original) An integrated circuit as in claim 4, further comprising:
a conductive diffusion barrier comprising a conductive-barrier side edge, said bottom electrode being located on said conductive diffusion barrier; and wherein at least a portion of said oxygen barrier is located on said conductive-barrier side edge.

Claim 6 (Original) An integrated circuit as in claim 5, further comprising:
an insulator layer located between said switch and said capacitor, said conductive diffusion barrier being located on a portion of said insulator layer, and a portion of said oxygen barrier being located on said insulator layer.

Claim 7 (Original) An integrated circuit as in claim 6 wherein said insulator layer comprises a moat region, said moat region being defined partially by a moat sidewall and a moat bottom, said moat region being substantially coplanar with said bottom electrode and said conductive diffusion barrier, said moat bottom comprising a portion of said oxygen barrier, and said moat sidewall comprising a portion of said oxygen barrier.

Claim 8 (Original) An integrated circuit as in claim 7 wherein said insulator layer comprises an over-etched portion aligned with said conductive-barrier side edge, and wherein said bottom-electrode side edge, said conductive-barrier side edge, and said over-etched portion define a moat sidewall, and at least a portion of said oxygen barrier layer is

located on said bottom-electrode side edge, said conductive-barrier side edge, and said over-etched portion.

Claim 9 (Original) An integrated circuit as in claim 6 wherein said conductive diffusion barrier and said oxygen barrier together substantially completely cover said switch.

Claim 10 (Original) An integrated circuit as in claim 6 wherein said conductive diffusion barrier and said oxygen barrier together form a substantially continuous diffusion barrier between said capacitor and said switch.

Claim 11 (Original) An integrated circuit as in claim 6, further comprising a nonconductive hydrogen barrier layer, said nonconductive hydrogen barrier layer substantially completely covering said capacitor and said switch.

Claim 12 (Original) An integrated circuit as in claim 11 wherein said nonconductive hydrogen barrier layer comprises strontium tantalate.

Claim 13 (Original) An integrated circuit as in claim 12 wherein said nonconductive hydrogen barrier layer further comprises silicon nitride.

Claim 14 (Original) An integrated circuit as in claim 11 wherein said capacitor comprises a top electrode, and a portion of said nonconductive hydrogen barrier layer is located on said top electrode.

Claim 15 (Original) An integrated circuit as in claim 11 wherein said capacitor comprises a top plate-line electrode, and a portion of said nonconductive hydrogen barrier layer is located on said plate-line electrode.

Claim 16 (Original) An integrated circuit as in claim 15, further comprising an electrical connection to said top plate-line electrode, said electrical connection located remotely from said capacitor.

Claim 17 (Original) An integrated circuit as in claim 11 wherein said top electrode comprises a top-electrode side edge, and a portion of said nonconductive hydrogen barrier layer is located on said top-electrode side edge.

Claim 18 (Original) An integrated circuit as in claim 11 wherein said capacitor comprises a capacitor dielectric film comprising a capacitor-dielectric side edge,

and a portion of said nonconductive hydrogen barrier layer is located on said capacitor-dielectric side edge.

Claim 19 (Original) An integrated circuit as in claim 5 wherein said conductive barrier layer comprises titanium aluminum nitride.

Claim 20 (Original) An integrated circuit as in claim 1, further comprising a nonconductive hydrogen barrier layer, said nonconductive hydrogen barrier layer substantially completely covering said capacitor and said switch.

Claim 21 (Original) An integrated circuit as in claim 20, further comprising a non-memory portion, said non-memory portion not being covered by said hydrogen barrier layer.

Claim 22 (Original) An integrated circuit as in claim 20 wherein said nonconductive hydrogen barrier layer comprises strontium tantalate.

Claim 23 (Original) An integrated circuit as in claim 22 wherein said nonconductive hydrogen barrier layer further comprises silicon nitride.

Claim 24 (Original) An integrated circuit as in claim 1 wherein said capacitor comprises a thin film of ferroelectric layered superlattice material.

Claim 25 (Original) An integrated circuit as in claim 24 wherein said thin film comprises ferroelectric layered superlattice material selected from the group consisting of strontium bismuth tantalate and strontium bismuth tantalum niobate.

Claim 26 (Original) An integrated circuit as in claim 25 wherein said thin film has a thickness not exceeding 90 nm.

Claim 27 (Original) An integrated circuit comprising:
an element sensitive to degradation by oxygen; and
a nonconductive oxygen barrier layer located to protect said element, said oxygen barrier layer comprising strontium tantalate.

Claim 28 (Original) An integrated circuit as in claim 27 wherein said oxygen barrier layer further comprises silicon nitride.

Claim 29 (Original) An integrated circuit as in claim 27, further comprising an electrically conductive diffusion barrier located proximate to said oxygen barrier layer, said

conductive diffusion barrier and said oxygen barrier together forming a substantially continuous diffusion barrier to protect said element.

Claims 30 – 55 (Canceled)

Claim 56 (New) An integrated circuit, comprising:

a switch;

a capacitor; and

a conductive oxygen barrier located between said switch and said capacitor.

Claim 57 (New) An integrated circuit as in claim 56 and further including an insulator layer located between said switch and said capacitor and wherein:

said capacitor includes a bottom electrode located on said conductive oxygen barrier; and

a portion of said conductive oxygen barrier is located on said insulator layer.

Claim 58 (New) An integrated circuit as in claim 57 wherein said conductive oxygen barrier includes a side edge portion and said insulator layer comprises a moat region, said moat region being defined partially by a moat sidewall and a moat bottom, and said moat sidewall including said side edge portion of said conductive oxygen barrier.

Claim 59 (New) An integrated circuit as in claim 58 wherein said insulator layer comprises an over-etched portion aligned with said conductive oxygen barrier side edge, and wherein said bottom-electrode side edge, said conductive oxygen barrier side edge, and said over-etched portion define said moat sidewall.

Claim 60 (New) An integrated circuit as in claim 59 and further including a nonconductive oxygen barrier layer located on said bottom-electrode side edge, said conductive-barrier side edge, and said over-etched portion.

Claim 61 (New) An integrated circuit as in claim 56 wherein said capacitor includes a ferroelectric material.

Claim 62 (New) An integrated circuit as in claim 61 wherein said ferroelectric material comprises a layered superlattice material.